



Method for the use of polyhydroxyalkanoate levels to maintain bioreactor health

Description of Technology: The present invention relates to methods for monitoring and controlling biological activity in wastewater and controlling the treatment thereof. Specifically a method has been developed that correlates the production of polyhydroxyalkanoates (PHA) with bioreactor health and biocatalytic efficiency.

Patent Listing:

1. **US Patent No. 6991931**, Issued January 31, 2006, “Method for the use of polyhydroxyalkanoate levels to maintain bioreactor health”

<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=6991931.PN.&OS=PN/6991931&RS=PN/6991931>

Market Potential: The goal of wastewater bioreactors is to mineralize inlet organic and inorganic compounds (nitrogen oxides e.g., nitrate, nitrite, and ammonia) to carbon dioxide and nitrogen gas resulting in a clean effluent stream. The efficiency of industrial wastewater treatment systems is especially important since loss of performance/capacity to treat process wastewater translates to lower manufacturing up time. Presently, there are no rapid methods to assess the biocatalytic capacity of wastewater reactors.

This method provides a facile, highly responsive method of monitoring activated sludge environments to rapidly predict loss of denitrification activity and other indicators of biocatalytic efficiency such as the concentrations of nitrate, ammonia, sulfate, phosphate and carbon dioxide in the system.

Polyhydroxyalkanoates or PHAs are linear polyesters produced in nature by bacterial fermentation of sugar or lipids. More than 100 different monomers can be combined within this family to give materials with extremely different properties.

The three main competitors in the water services market are California Water Services Group, American States Water Co., and American Water Works. California Water Services Group had \$26 million in net profit in 2004. American States Water Co. had a net profit of \$18.5 million in 2004. American Water Works serves 20 million people in the US and Canada.

Benefits:

- Facile, highly responsive method of monitoring activated sludge environments
- Rapidly predicts loss of denitrification activity and other indicators of biocatalytic efficiency

Applications:

- Environment Biology
- Lake and Pond Resources

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